WHAT IS CLAIMED IS

1. An optical signal processing system to convert a serial pulse train optical signal with transmission speed N to parallel pulse train electrical signals comprising:

a serial-parallel converter in which at least two cascaded optical switches are provided, each of which receives said serial pulse train optical signal as an input to the input terminal and outputs a pulse train optical signal with transmission speed M equal to a value obtained by dividing the transmission speed N by an integer to one of the two output terminals and outputs remaining pulse train optical signals to the alternative one of said two output terminals by switching the connection to said output terminals,

receiving parts which are provided for each optical switch located in said serial-parallel converter and convert the optical signals from one of two output terminals of each of said optical switches to electrical signals,

a synchronizing circuit which extracts clock signals from electrical signals output from one of said plurality of receiving parts and outputs timing signals in synchronization with these clock signals, and

drivers which are provided for each of said optical switches located in said serial-parallel converter and cause said optical switches to switch their connections based on timing signals output from said synchronizing circuit.

2. An optical signal processing system in accordance with claim 1, wherein an optical terminator is provided, which carries out termination processing of optical signals output from the alternative one of two output terminals of the last stage optical switch located in said serial-parallel converter.

3. An optical signal processing system to convert a serial pulse train optical signal with transmission speed N to parallel pulse train electrical signals comprising:

a serial-parallel converter in which at least two cascaded optical switches are provided, each of which receives said serial pulse train optical signal as an input to each input terminal and outputs a pulse train optical signal with transmission speed M equal to a value obtained by dividing the transmission speed of N by an integer to one of the

two output terminals and outputs remaining pulse train optical signals to the alternative one of said two output terminals by switching the connection to said output terminals,

receiving parts which are provided for each optical switch located in said serial-parallel converter and convert the optical signals from one of the two output terminals of each of said optical switches to electrical signals,

a second receiving part which outputs electrical signals corresponding to the optical power of optical signals output from the alternative one of said two output terminals of the last stage optical switch located in said serial-parallel converter,

a synchronizing circuit which outputs timing signals based on electrical signals output from said second receiving part, and

drivers which are provided for each of optical switches located in said serial-parallel converter and cause said optical switches to switch their connections based on timing signals output from said synchronizing circuit.

4. An optical signal processing system in accordance with claim 3, wherein said second receiving part integrates the optical power of optical signals during at least an interval equivalent to periods of said serial pulse train optical signal, the number of the periods being equal to the number of optical switches provided in said serial-parallel converter.

5. An optical signal processing system in accordance with any of claims 1 to 4, wherein said serial pulse train optical signal with transmission speed N is an optical time division multiplexing signal.

6. An optical signal processing system in accordance with any of claims 1 to 5, wherein delay lines, each of which delays said pulse train optical signal with transmission speed N by an interval equivalent to its one period, are provided between optical switches located in said serial-parallel converter.

7. An optical signal processing system in accordance with any of claims 1 to 6, wherein a data regenerating part is provided which changes at least either the modulation scheme or pulse width of electrical signals received by said receiving parts using timing signals from said synchronizing circuit, and outputs the resulting electrical signals.

8. An optical signal processing system in accordance with any of claims 1 to 7, wherein said drivers cause connection of said optical switches to be made to one of two output terminals of each of said optical switches for at most one period of said serial pulse train optical signal with transmission speed N when timing signals are input from said synchronizing circuit.